

RECEIVED
CENTRAL FAX CENTER

SEP 21 2006

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Previously Presented): An opto-electronic module having an optical port and an electrical port comprising:

a planar first substrate having a top surface and a bottom surface, electrical traces, a port end, and an interior end;

an opto-electronic device attached to and electrically connected to the top surface of the first substrate wherein the opto-electronic device serves as the optical port wherein the opto-electronic device comprises:

a semiconductor chip package having a top surface and a bottom surface with top and bottom electrical contacts, the bottom surface mounted directly on the top surface of the first substrate with the bottom electrical contacts at the bottom surface of the chip package being electrically connected to the electrical traces of the first substrate;

a support block for supporting an optical device package, the support block having a first face and a second face that are angled relative to one another with electrical traces that extend from the first face to the second face wherein the first face of the support block is mounted on the top surface of the chip package so that the top electrical contacts of the chip package are electrically coupled to associated traces on the support block; and

an optical device package mounted on the second face of the support block, the optical device package having at least one active facet thereon and having electrical contacts that are electrically coupled to associated traces on the support block;

a second planar substrate having electrical traces, the second substrate having a port end and an interior end, wherein the port end forms the electrical port;

a flex connector that is a flexible band containing a plurality of electrically conductive lines, wherein the conductive lines of the flex connector electrically connect the electrical traces of the first and the second substrates, whereby the flex connector allows for the adjustable positioning of the height of the optical port with respect to the height of the electrical port; and

Atty. Dkt. No. NSC1P271/P05589

Page 2 of 9

Application No. 10/621,035

an external case configured to enclose the first and second substrates as well as all components mounted thereon, the case enabling optical communication between the optical device package and an external optical component and enabling electrical connection to the port end of the second substrate.

2. (Previously Presented): An opto-electronic module as recited in claim 1 wherein the conductive lines of the flex connector are suitable for transmitting differential signals between the first and the second substrate.

3. (Previously Presented): An opto-electronic module as recited in claim 2 wherein the conductive lines of the flex connector are connected to the interior end of the second substrate and the interior end of the first substrate.

4. (Previously Presented): An opto-electronic module as recited in claim 1 wherein the semiconductor chip package includes:

a semiconductor die that is at least partially encapsulated within a protective molding material;

wherein the top electrical contacts of the chip package comprise electrical contacts formed on a top surface of the semiconductor die such that the contacts are exposed through a surface of the protective molding material; and

wherein the optical device package is mounted to the top surface of the protective molding material such that the optical device package is electrically connected to the chip package using the electrical traces of the support block and the exposed electrical contacts.

5. (Previously Presented): An opto-electronic module as recited in claim 4 wherein the optical device package is suitable for receiving or sending optical signals; and

wherein the support block includes electrical traces formed on a flexi tape that is mounted on the support block and extends from the first face to the second face of the block so that the optical device package is electrically connected to the electrical traces of the flexi tape and the exposed electrical contacts of the semiconductor package.

6. (Previously Presented): An opto-electronic module as recited in claim 5 wherein there are a plurality of photonic devices attached to the support block, wherein at least one photonic device is configured to receive optical signals and at least one photonic device is configured to send optical signals.

7. (Previously Presented): An opto-electronic module as recited in claim 5 further comprising:

an electrical converter that is located on the second face of the support block such that single ended signals travel between the photonic device and the electrical converter, wherein the electrical converter converts single ended signals from the photonic device into differential signals such that differential signals are transmitted to the electrical port and wherein the electrical converter converts differential signals from the electrical port into single ended signals that are transmitted to the photonic device.

8. (Previously Presented): An opto-electronic module as recited in claim 1 wherein the first and second faces of the support block are substantially perpendicular to one another.

9. (Original): An opto-electronic module as recited in claim 4 further comprising:

a barrel unit that is attached to the optical device package, the barrel unit having at least one hollow tube that provides optical access to the optical device package.

10. (Original): An opto-electronic module as recited in claim 1 wherein the opto-electronic device further comprises:

a semiconductor device package having a semiconductor die that is at least partially encapsulated within a protective molding material; and

an optical device package that is in electrical communication with the semiconductor device package.

11. (Original): An opto-electronic module as recited in claim 10 wherein the optical device package further comprises:

at least one photonic device suitable for receiving or sending optical signals.

12. (Previously Presented): An opto-electronic module as recited in claim 1 wherein the first substrate further comprises:

at least one electronic device attached to a surface of the first substrate wherein the electronic device is secured to a position that is directly adjacent to the semiconductor chip package.

13. (Original): An opto-electronic module as recited in claim 1 wherein the first substrate is substantially rigid.

14. (Original): An opto-electronic module as recited in claim 1 wherein the second substrate has a top surface and a bottom surface, and wherein the electrical port includes electrical contacts on the top surface, bottom surface, or top and bottom surfaces of the second substrate.

15. (Original): An opto-electronic module as recited in claim 1 wherein the first and second substrates are printed circuit boards.

16. (Original): An opto-electronic module as recited in claim 1 wherein the electrical and the optical ports face in opposite directions.

17. (Original): An opto-electronic module as recited in claim 1 wherein the second substrate is substantially rigid.

18. (Original): An opto-electronic module as recited in claim 1 wherein the first and second substrates are substantially rigid.

19. (Original): An opto-electronic module as recited in claim 1 wherein the opto-electronic module is suitable for sending, receiving, or sending and receiving data signals at a rate of approximately 2.5 Giga bytes per second or greater.

20. (Original): An opto-electronic module as recited in claim 1 further comprising:
a case that contains the opto-electronic module wherein the case has an optical interface opening to provide access to the optical port and an electrical interface opening to provide access to the electrical port.

21. (Original): An opto-electronic module as recited in claim 1 wherein the flex connector is integrally formed with the first and the second substrate.

22-27. (Cancelled)

28. (Previously Presented): An opto-electronic module as recited in claim 7 wherein the electrical converter located on the second face is located in close proximity to the optical device package.

29-31 (Cancelled).

32. (New): An opto-electronic module as recited in claim 1 wherein the external case is configured to connect with a standard electro-optic form factor and configured so that the case enables optical communication between the optical device package and an external optical component and enables electrical connection between the port end of the second substrate and an external electrical connector.

33. (Previously Presented): An opto-electronic module as recited in claim 32 wherein the first substrate defines an optical plane and the second substrate defines an electrical plane and the

external case is further configured to secure the substrates at two different heights defined by the electro-optic form factor for which the module is to be employed.

34. (Previously Presented): An opto-electronic module as recited in claim 32 wherein the first substrate is mounted to the bottom interior surface of the external case and the second substrate is elevated above the bottom interior surface of the external case and not in contact with an upper interior surface of the external case.

35. (Previously Presented): An opto-electronic module as recited in claim 21 wherein the integrally formed flex connector comprises a thinned substrate integrally formed as part of the first and the second substrate.

36. (Cancelled).

37. (Previously Presented): An opto-electronic module having an optical port and an electrical port comprising:

a first planar substrate having electrical traces, an optical port end, and an opposite interior end;

an opto-electronic device attached to and electrically connected to the first substrate at the optical port end, wherein the opto-electronic device serves as the optical port wherein the opto-electronic device comprises:

a semiconductor chip package having upper chip electrical contacts on a top surface of the package and having lower chip electrical contacts on a lower surface of the package, the package being mounted directly on top of the first substrate;

a support block having a first face and a second face that are angled relative to one another with electrical traces that extend from the first face to the second face wherein the first face of the support block is mounted on top of the chip package so that at least some of the upper chip electrical contacts are electrically coupled to associated traces on the first face of the support block; and

a optical device package mounted on the second face of the support block, the optical device package having at least one active facet thereon and having electrical contacts that are electrically coupled to associated traces on the support block;

a second planar substrate having electrical traces, the second substrate having a port end on an end opposite from an interior end, wherein the port end forms the electrical port for electrically connecting the opto-electronic module with an external electrical device; and

an intermediate substrate of a predetermined offset thickness containing a plurality of electrically conductive lines, wherein the plurality of electrically conductive lines of the intermediate substrate connect the electrical traces of the first and the second substrates, wherein the thickness of the intermediate substrate separates the height of the optical port with respect to the height of the electrical port by a desired offset distance.

**This Page is Inserted by IFW Indexing and Scanning
Operations and is not part of the Official Record**

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

- BLACK BORDERS**
- IMAGE CUT OFF AT TOP, BOTTOM OR SIDES**
- FADED TEXT OR DRAWING**
- BLURRED OR ILLEGIBLE TEXT OR DRAWING**
- SKEWED/SLANTED IMAGES**
- COLOR OR BLACK AND WHITE PHOTOGRAPHS**
- GRAY SCALE DOCUMENTS**
- LINES OR MARKS ON ORIGINAL DOCUMENT**
- REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY**
- OTHER:** _____

IMAGES ARE BEST AVAILABLE COPY.

As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.